ABSTRACT

A first rotor integrally fixes a housing having the bearing of a camshaft, a case, which internally has a plurality of projecting shoes and which forms hydraulic chambers between these shoes, and a cover, which covers the hydraulic chambers, and the first rotor rotates integrally with a crank shaft. A second rotor has a plurality of vanes each dividing the hydraulic chamber into an advanced-angle hydraulic chamber and a retarded-angle hydraulic chamber, can rotate by a predetermined angle within the first rotor, and is integrally fixed with an intake or exhaust camshaft. A groove accommodating an energizing part, opposed to the shoe of the first rotor and to the vane of the second rotor, is provided on the opposite side to the housing.